

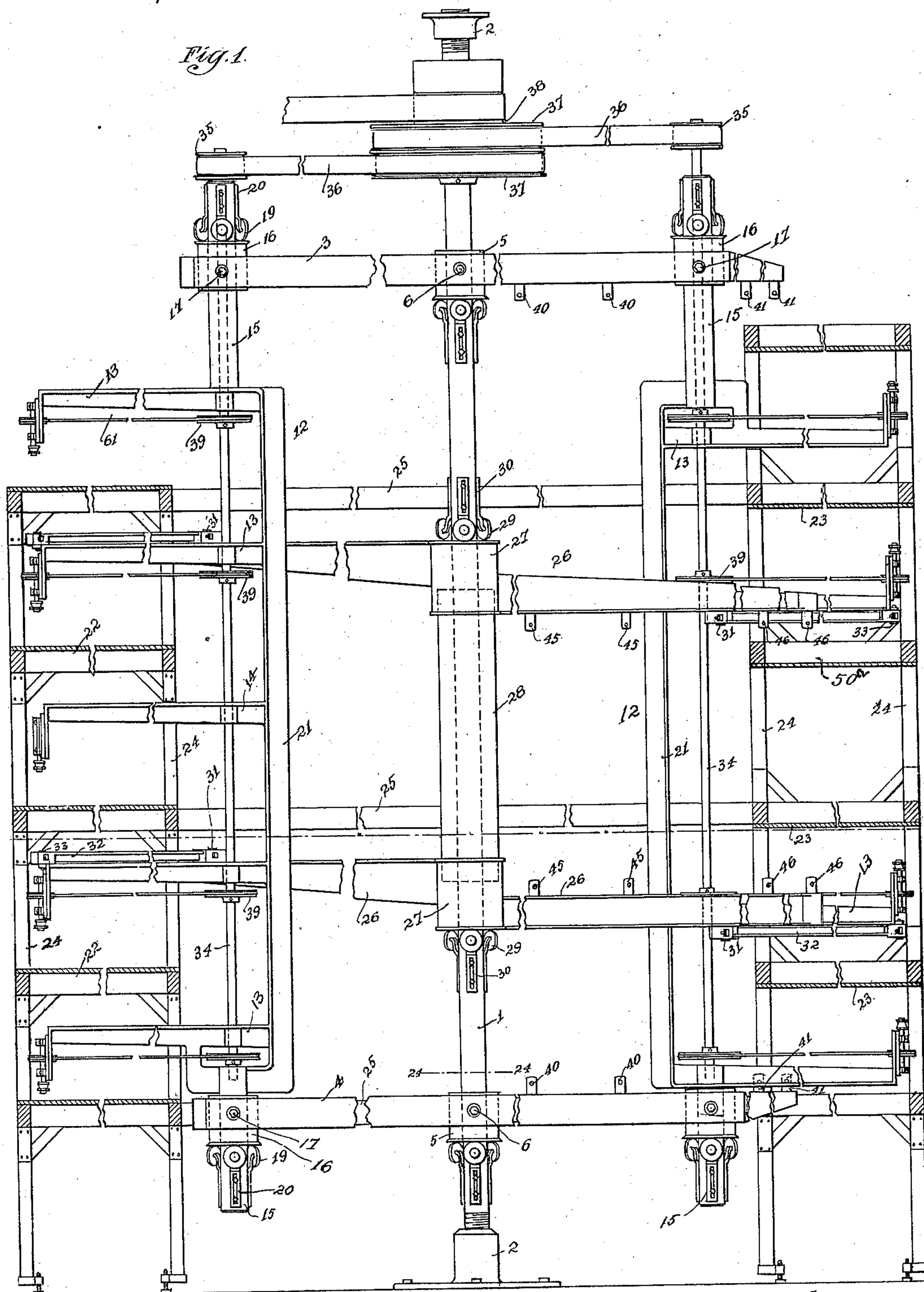
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5 Sheets—Sheet 1.

A. A. HAUSSKE.
CARVING MACHINE.

No. 561,510.

Patented June 2, 1896.



Witnesses:

Rudolph W. Lotz

Inventor
Anton Adolph Hausske
By Lotz & Kennedy
Attorneys

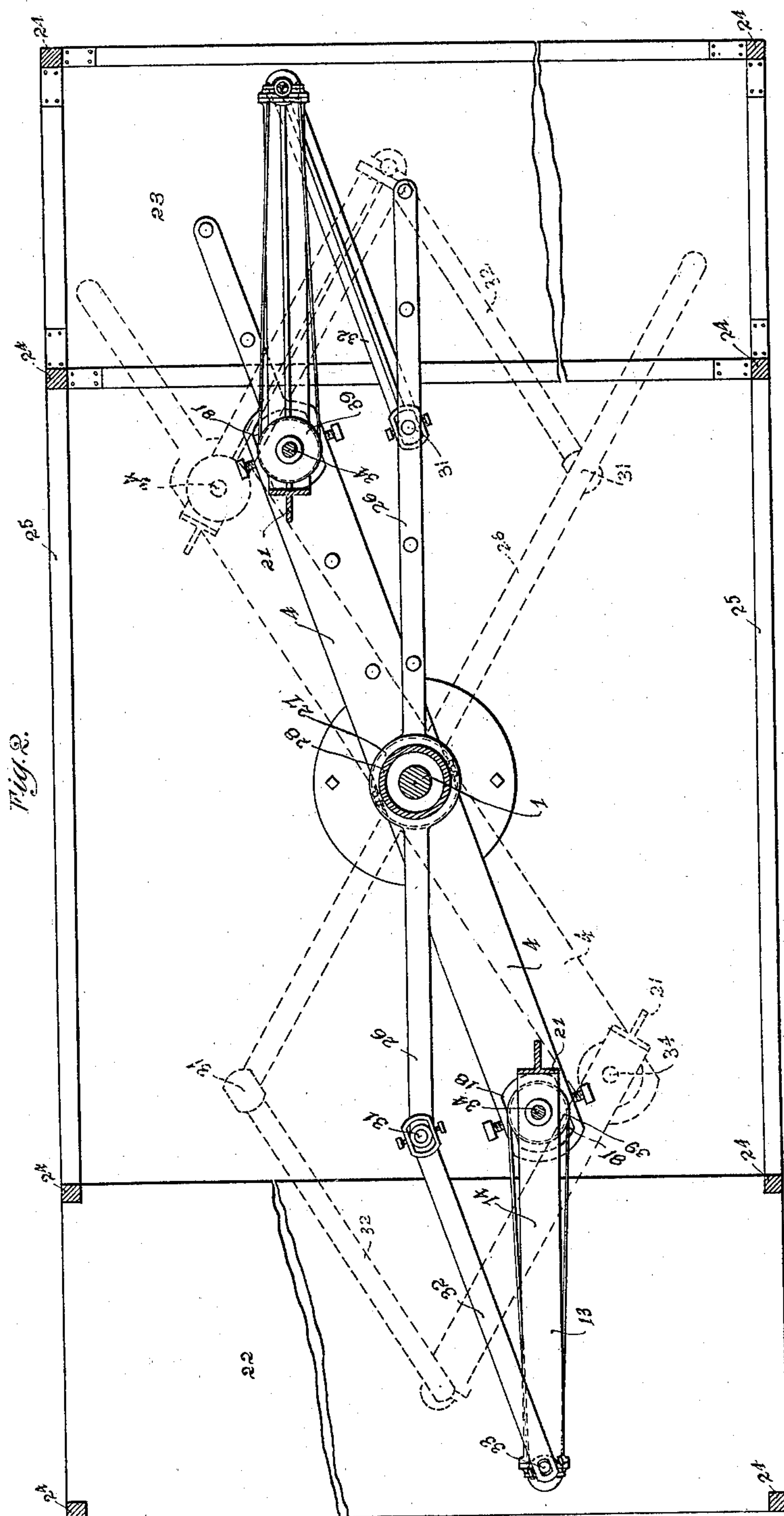
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5 Sheets—Sheet 2.

A. A. HAUSSKE.
CARVING MACHINE.

No. 561,510.

Patented June 2, 1896.



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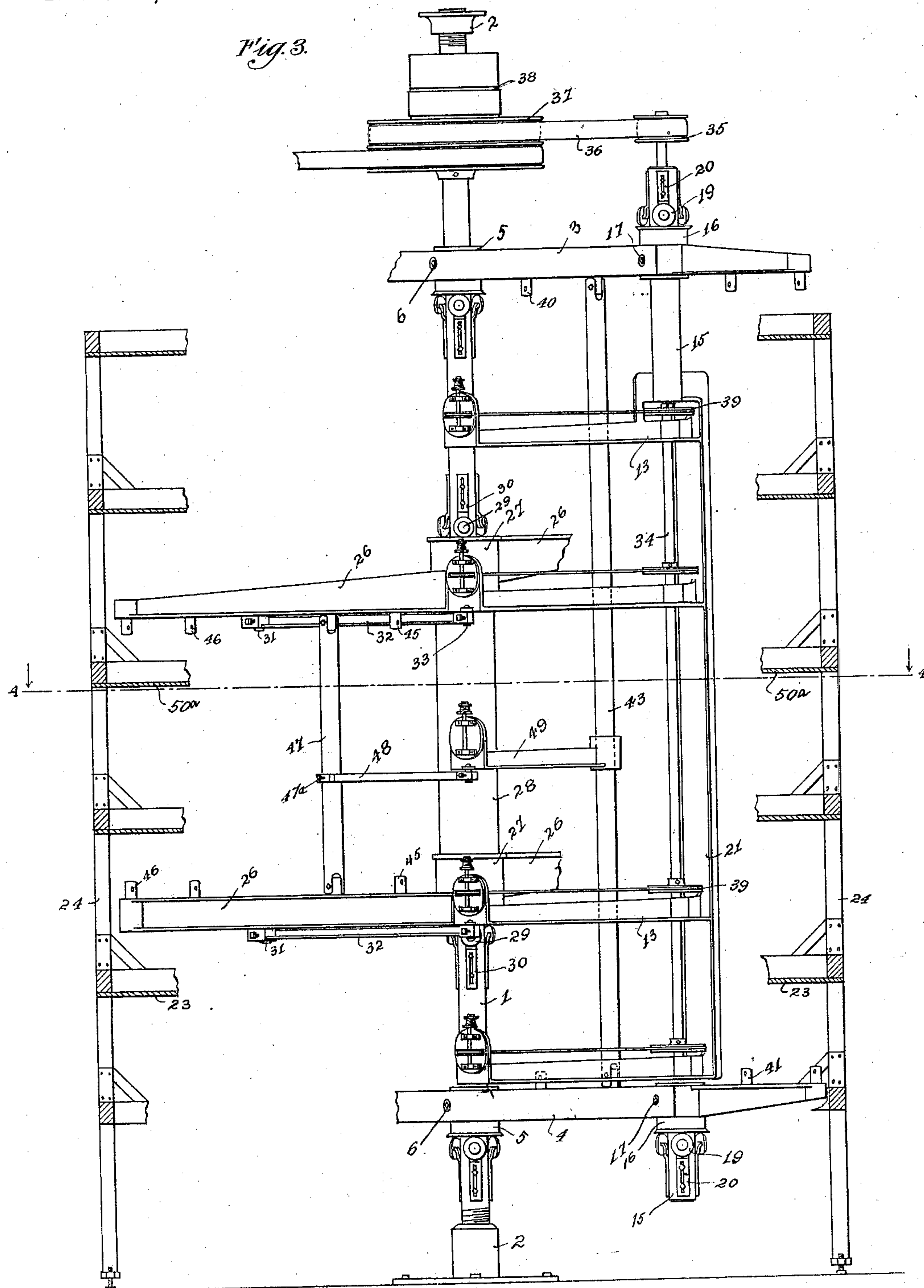
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5 Sheets—Sheet 3.

A. A. HAUSSKE.
CARVING MACHINE.

No. 561,510.

Patented June 2, 1896.



Witnesses:

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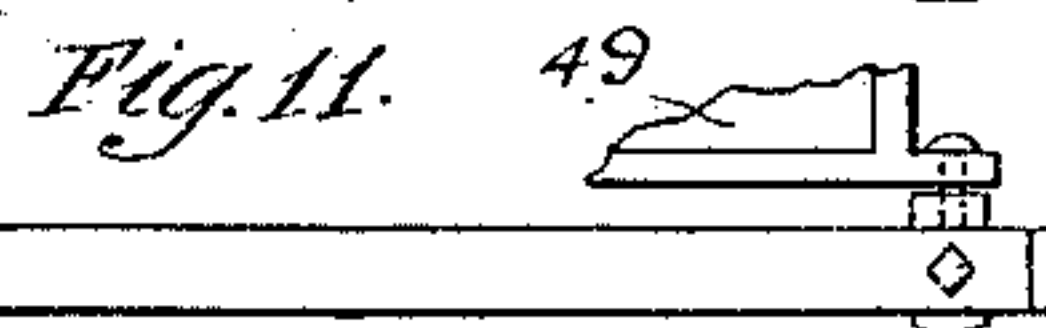
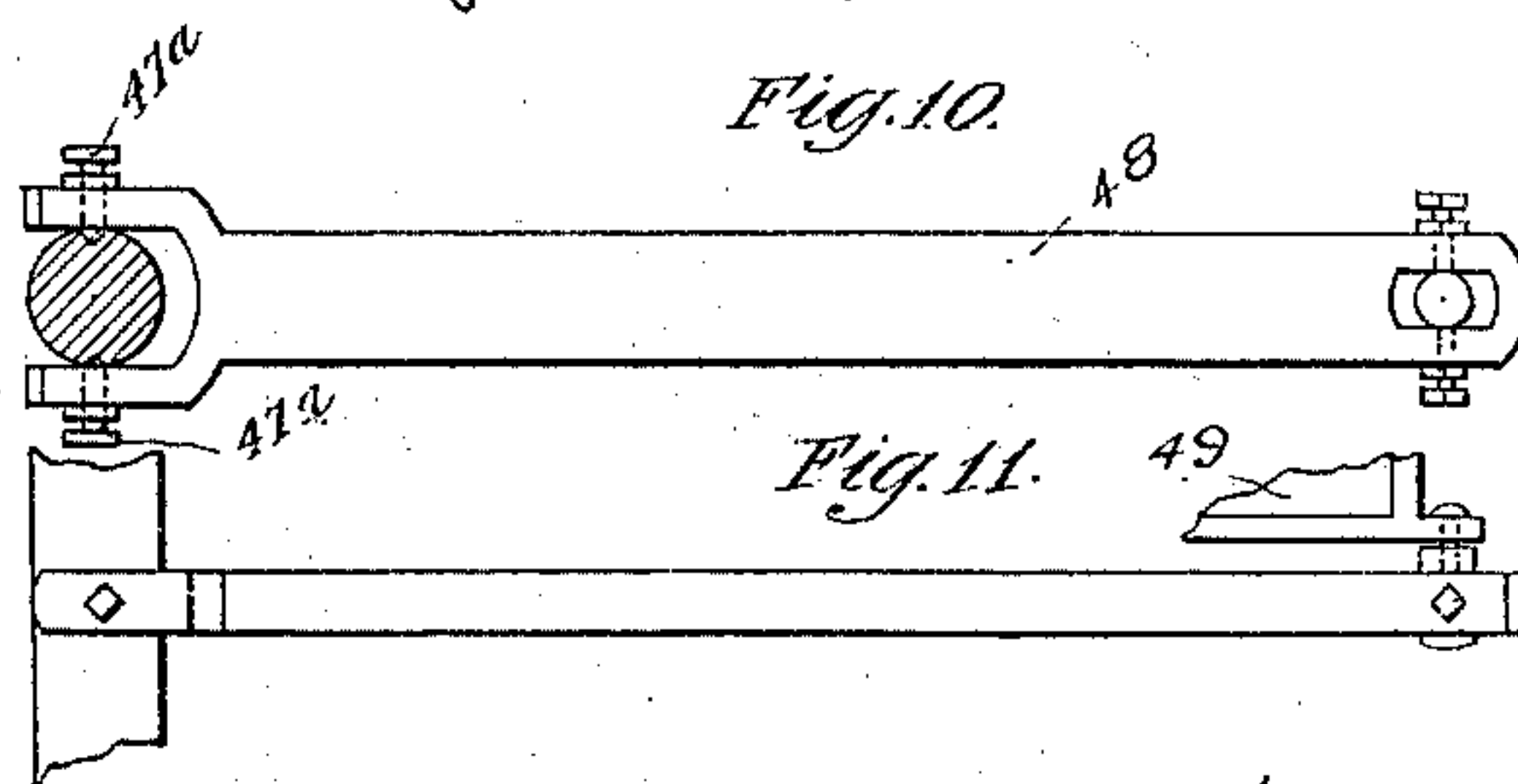
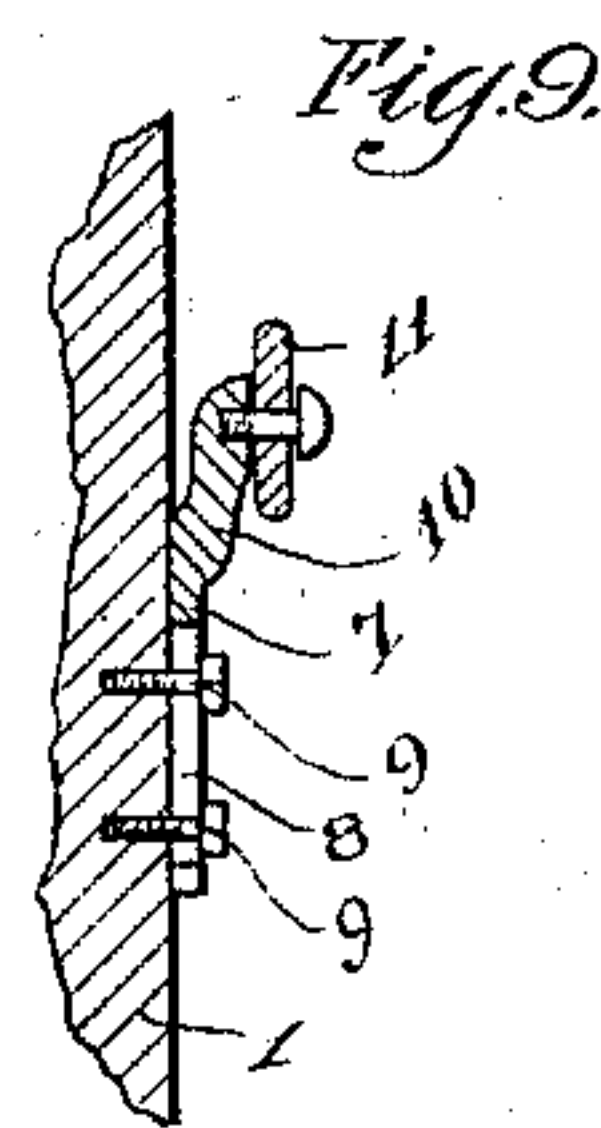
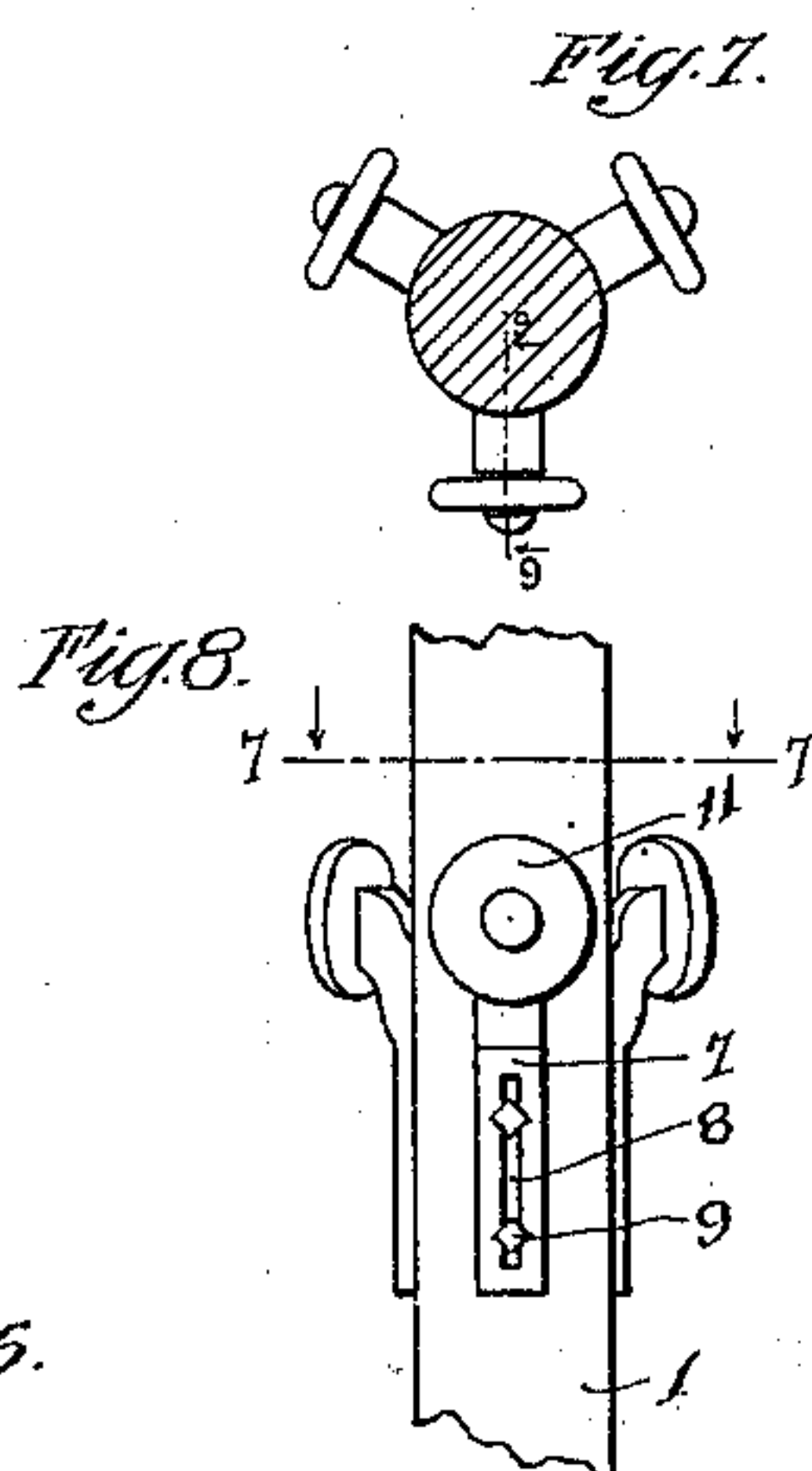
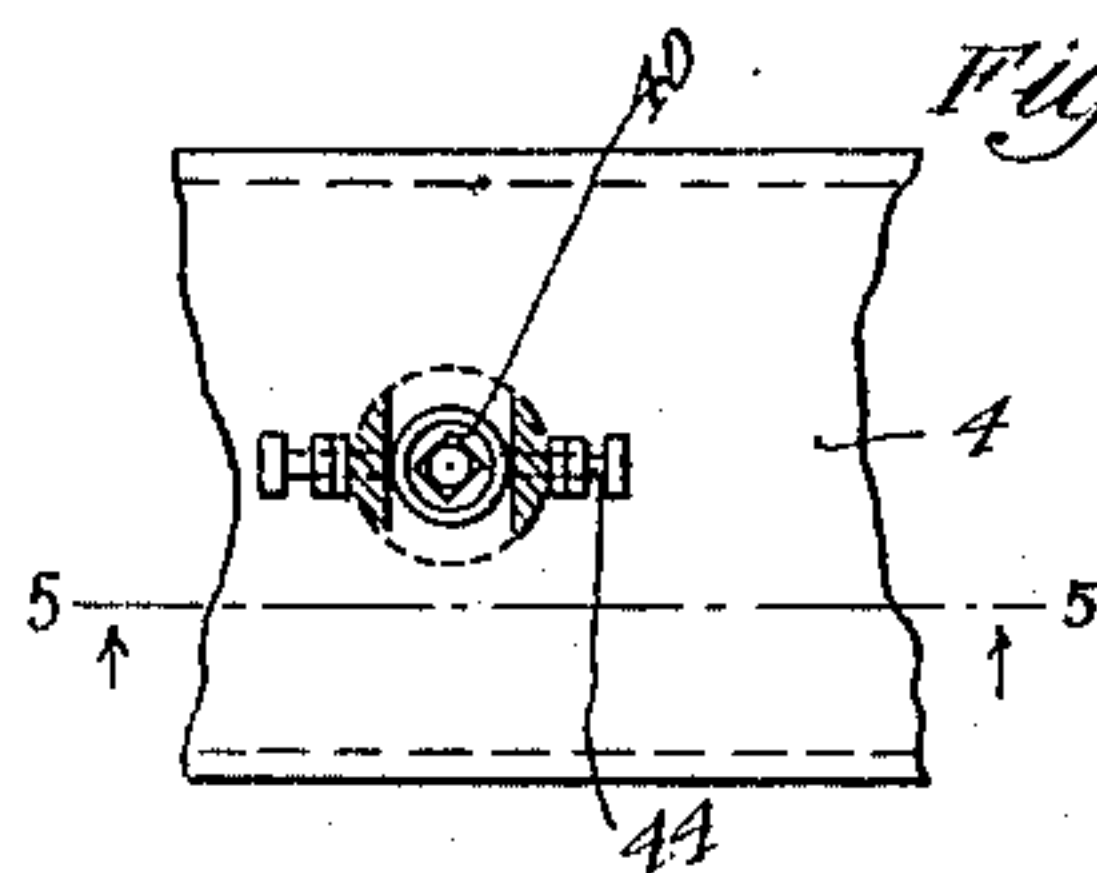
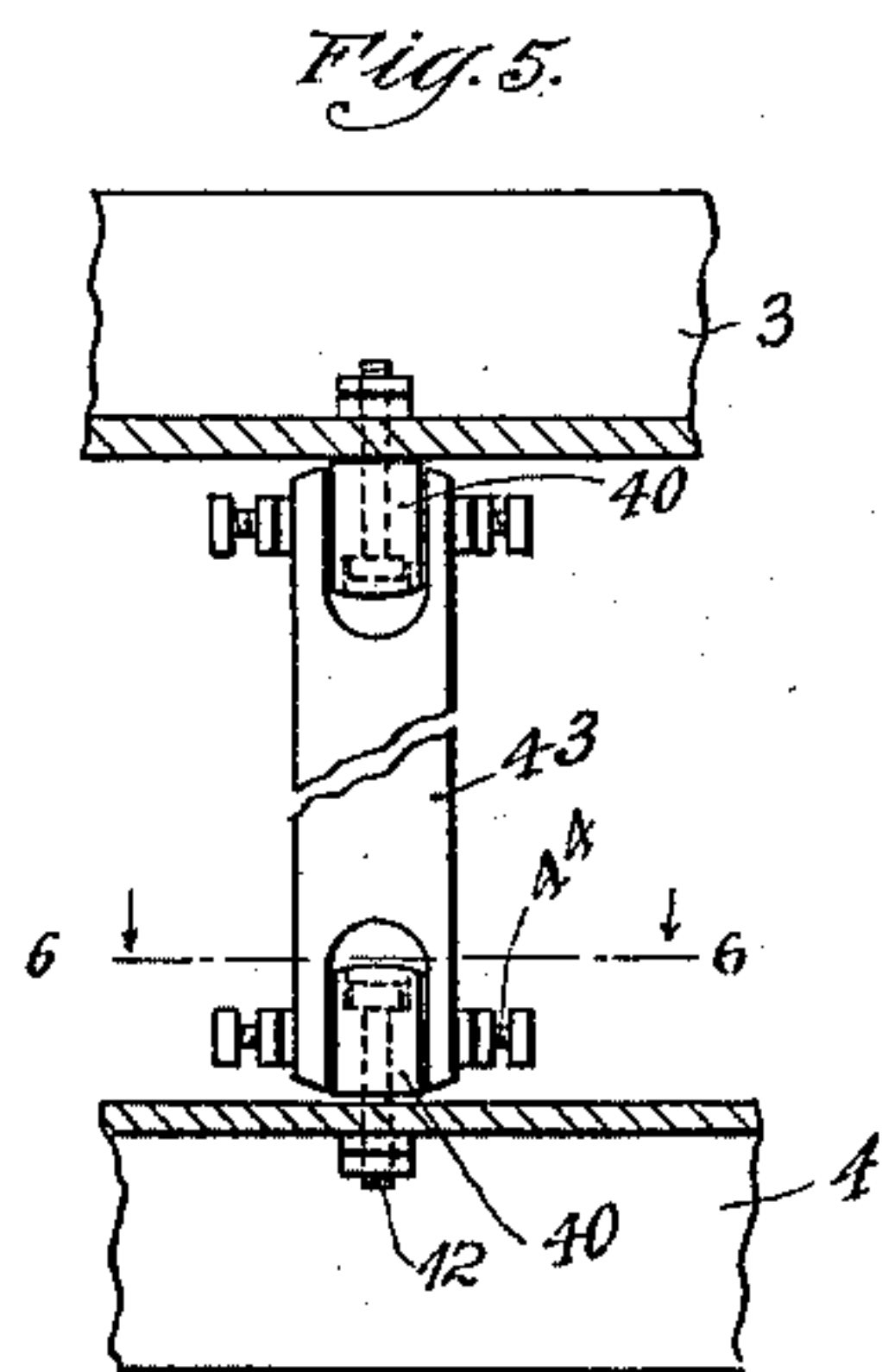
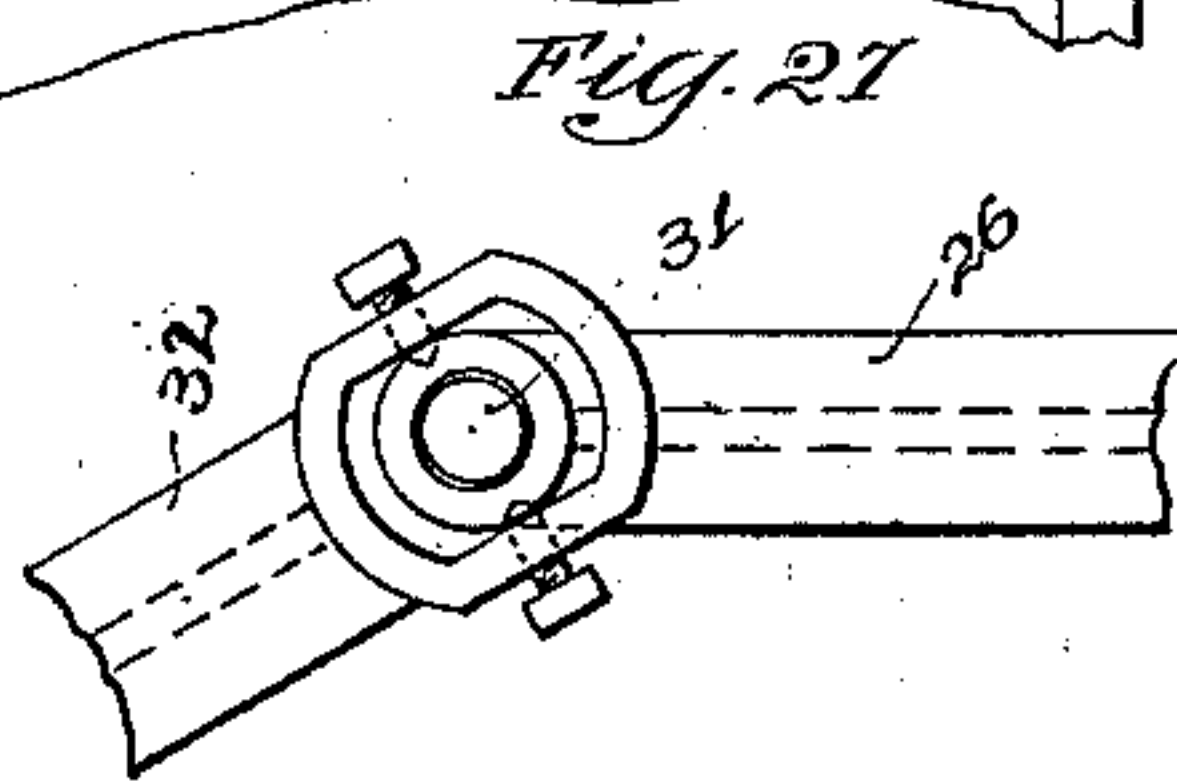
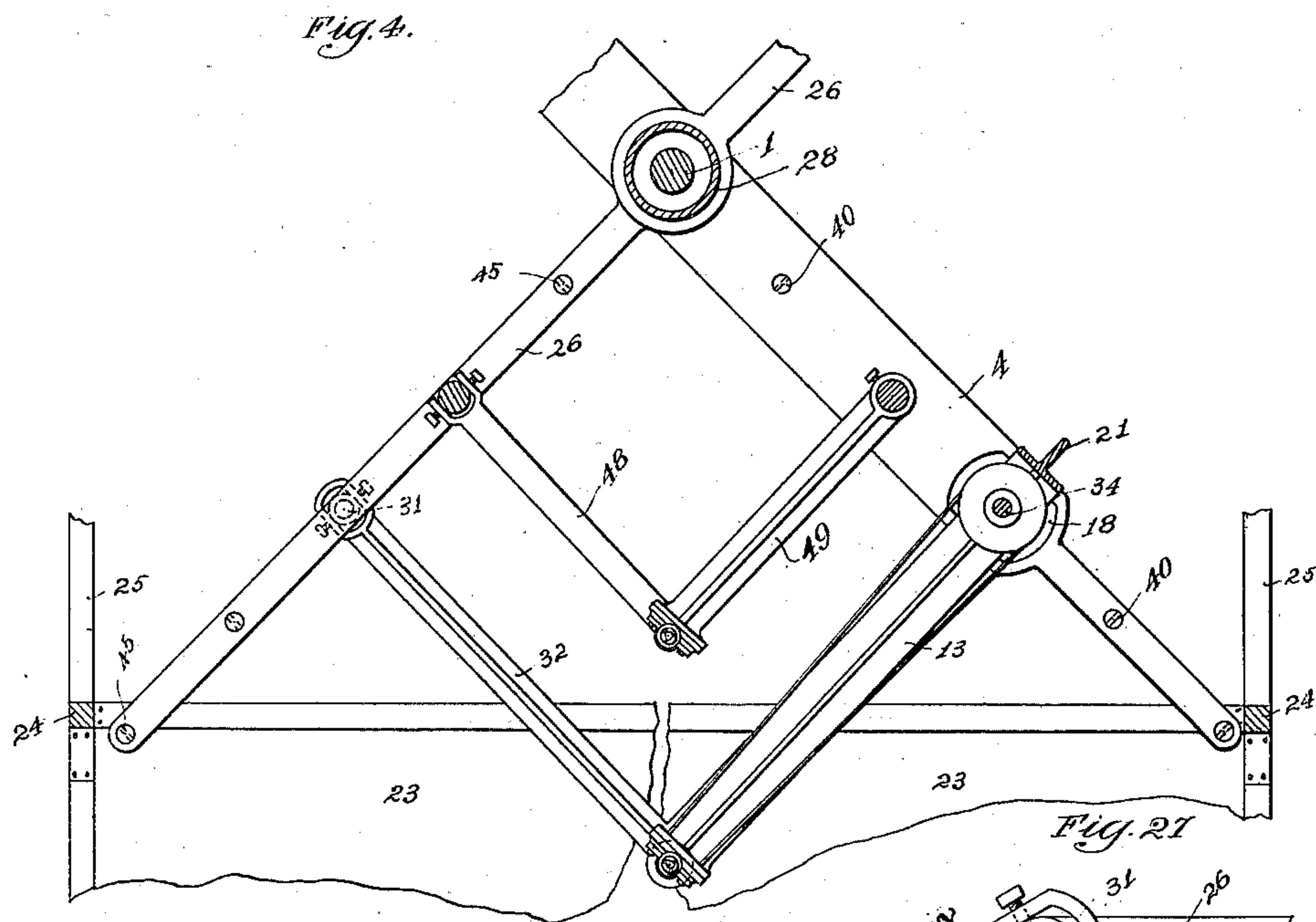
(No Model.)

5 Sheets—Sheet 4.

A. A. HAUSSKE.
CARVING MACHINE.

No. 561,510.

Patented June 2, 1896.



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(No Model.)

5 Sheets—Sheet 5.

A. A. HAUSSKE.
CARVING MACHINE.

No. 561,510.

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Fig. 12

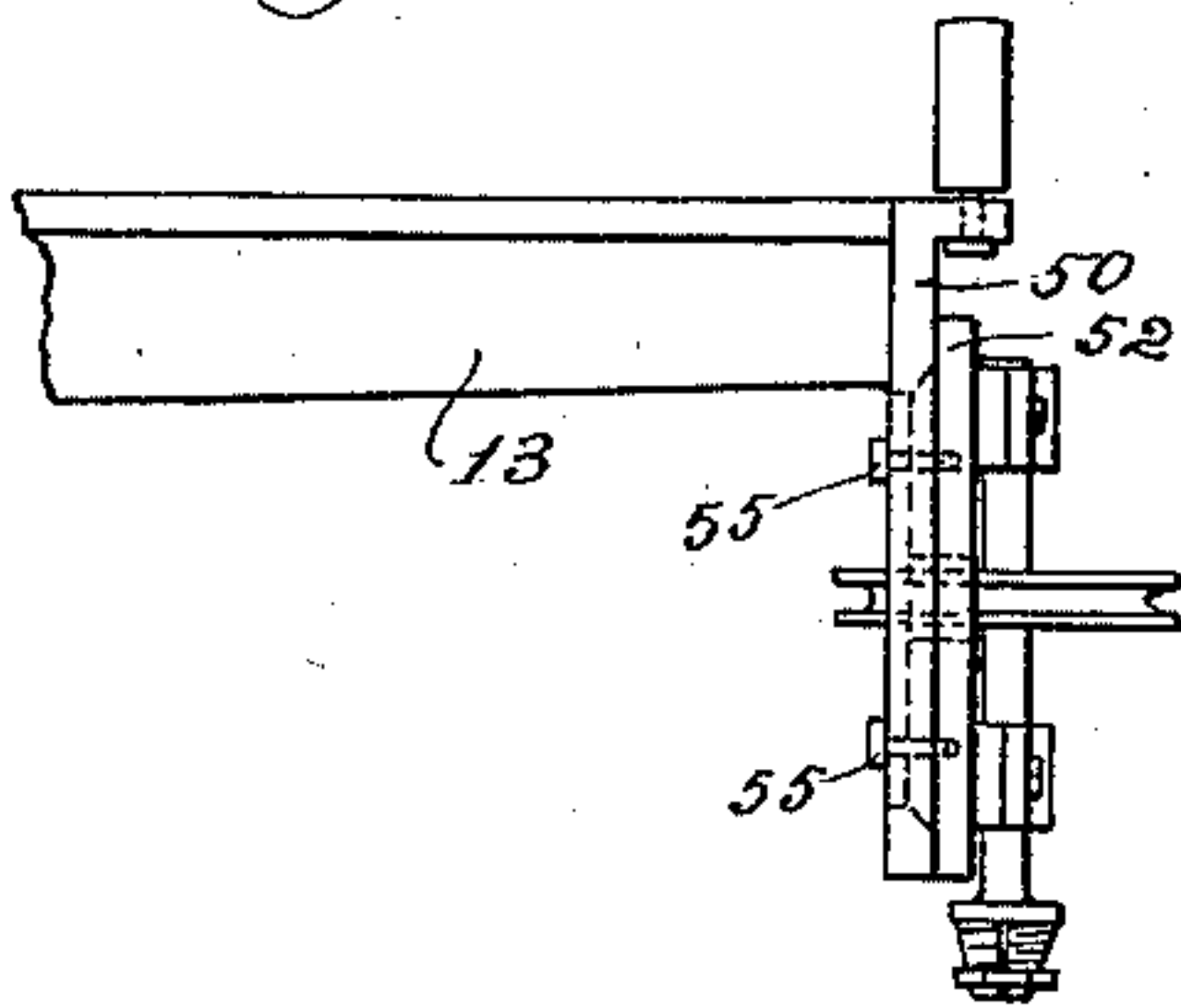


Fig. 13

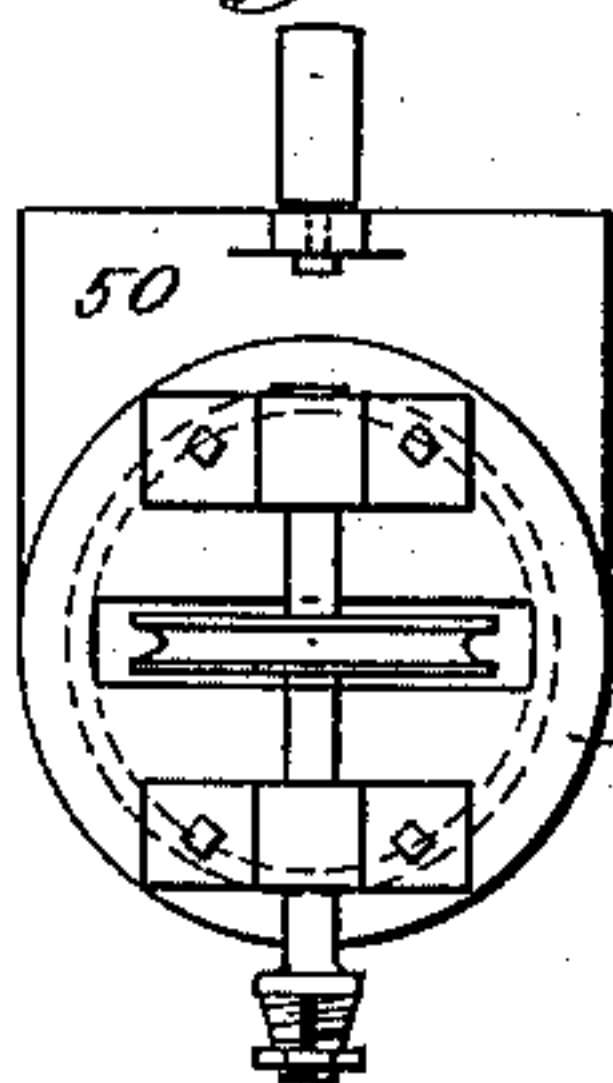


Fig. 14

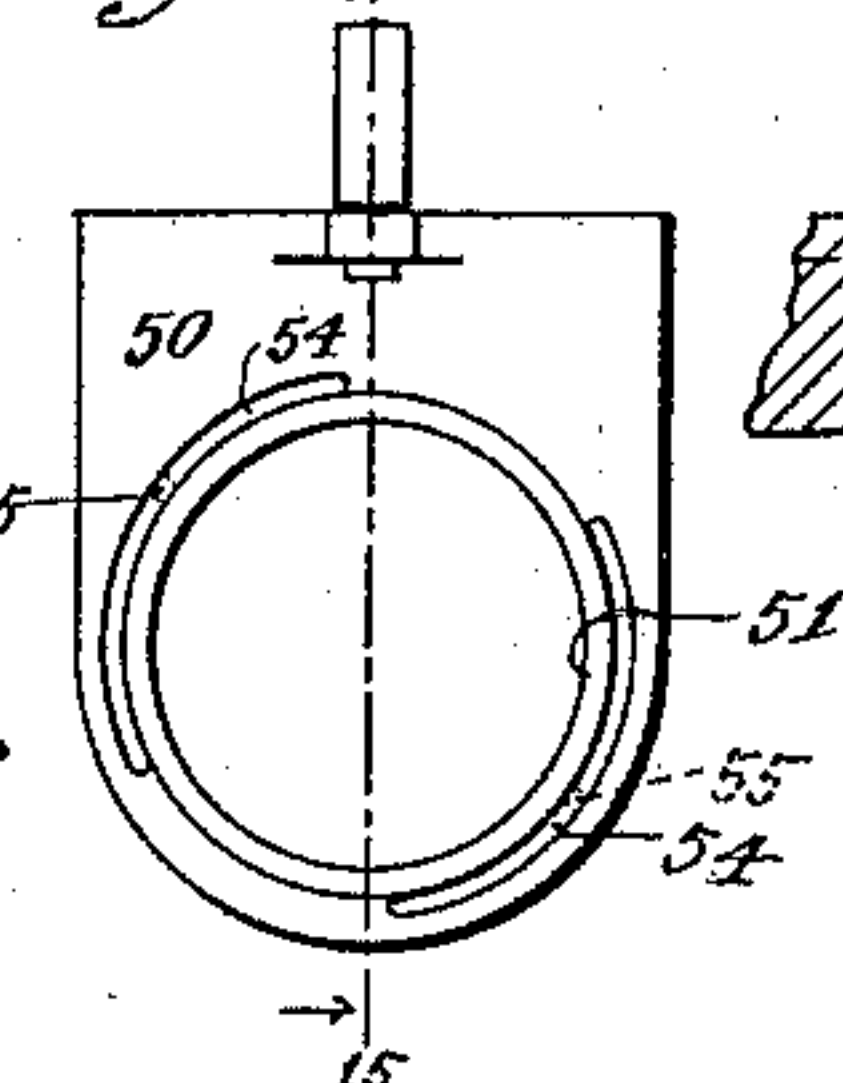


Fig. 15

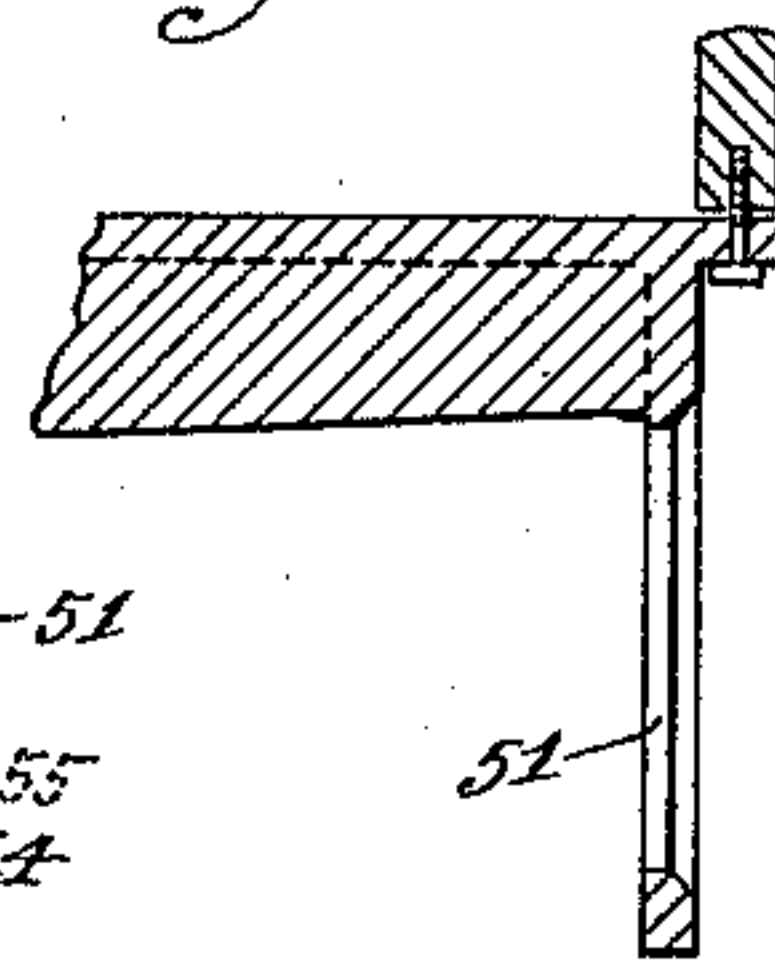


Fig. 16

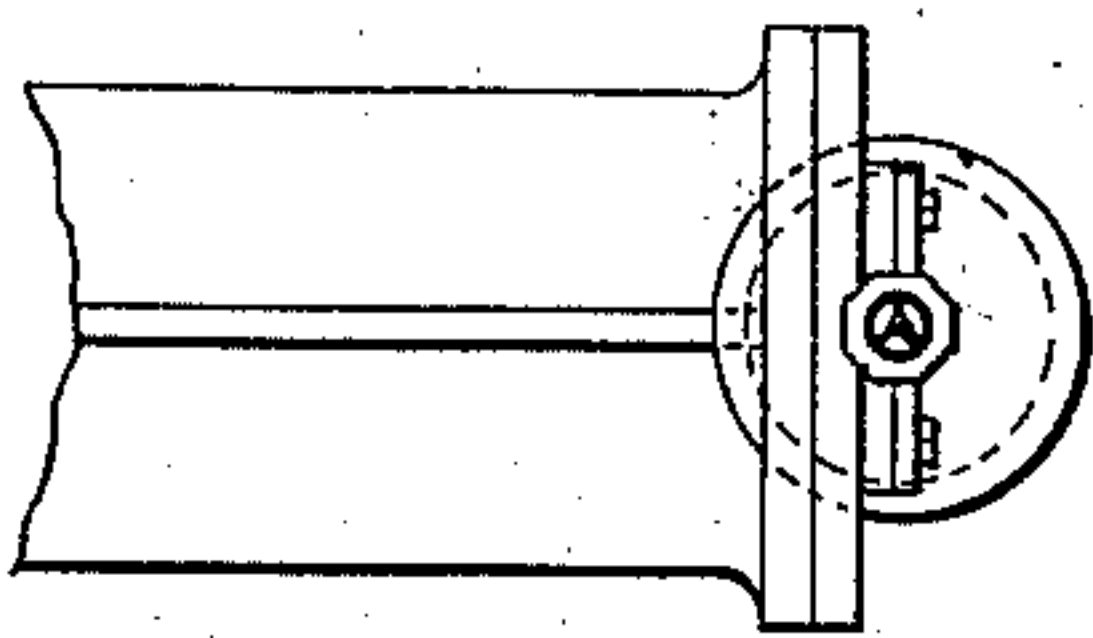


Fig. 18, 19

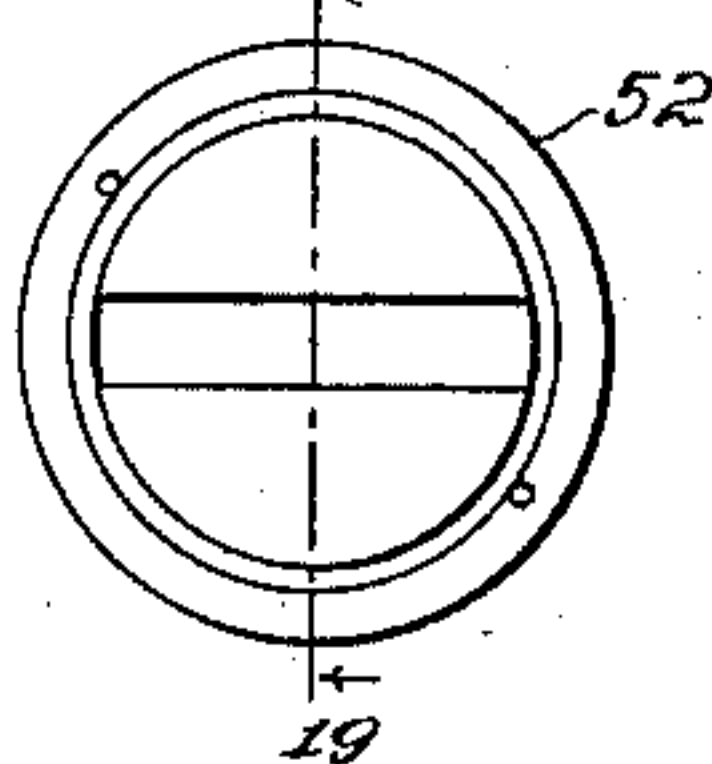


Fig. 19

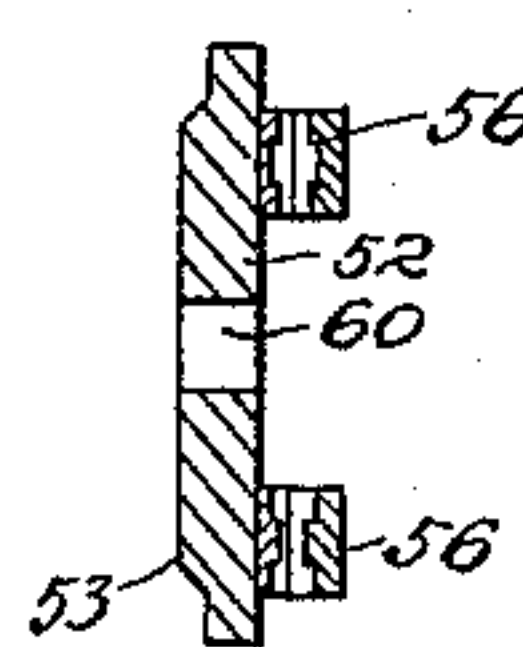


Fig. 20

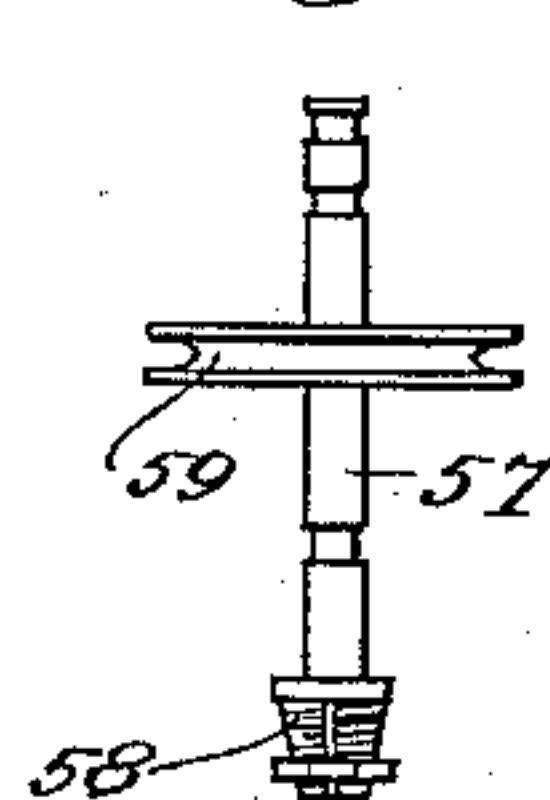


Fig. 17

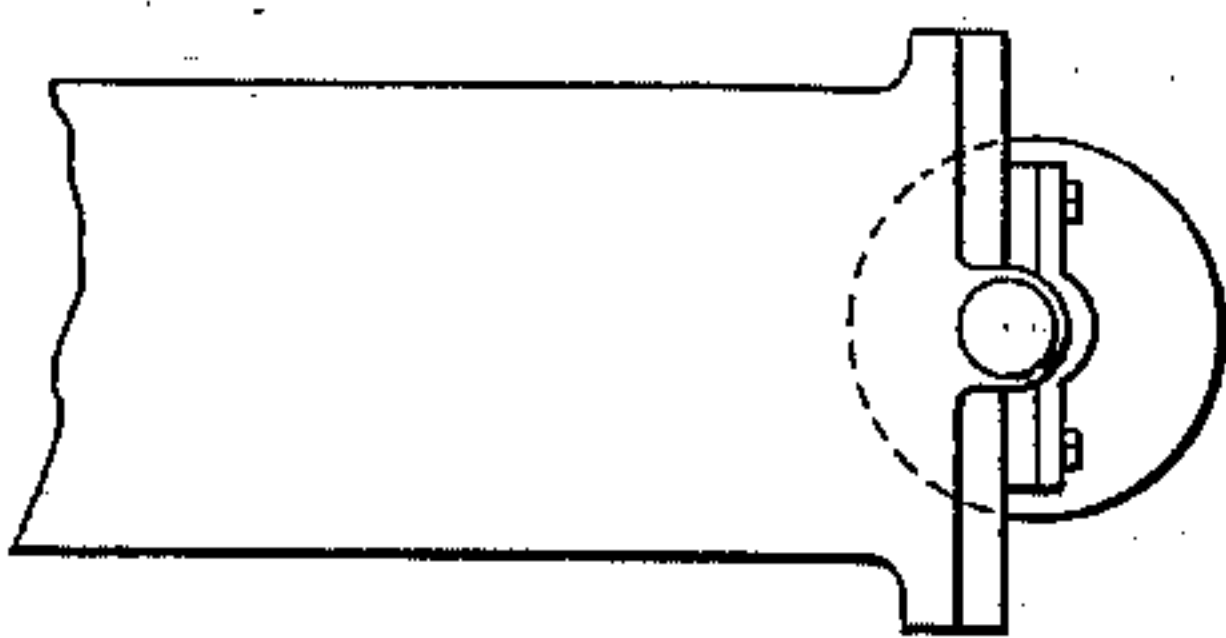


Fig. 21

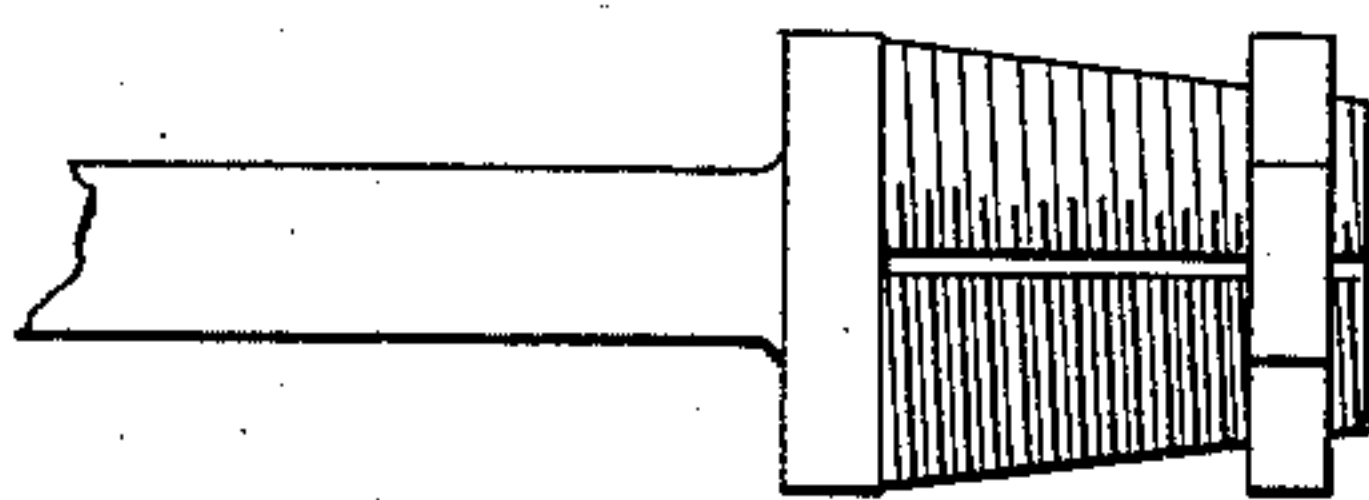


Fig. 23

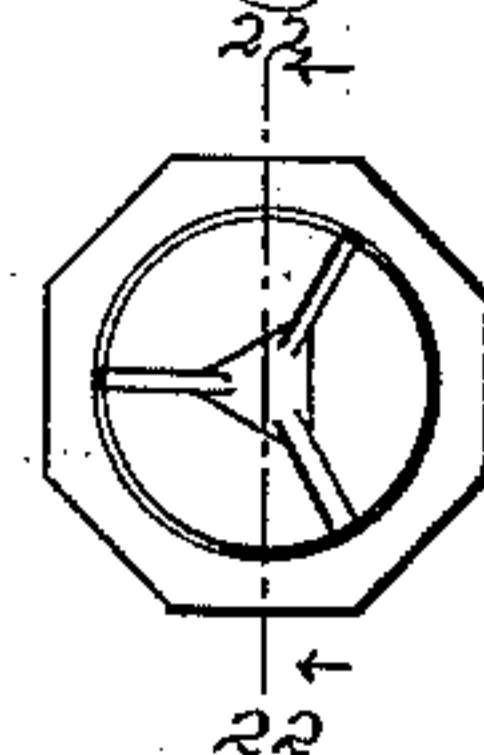


Fig. 22

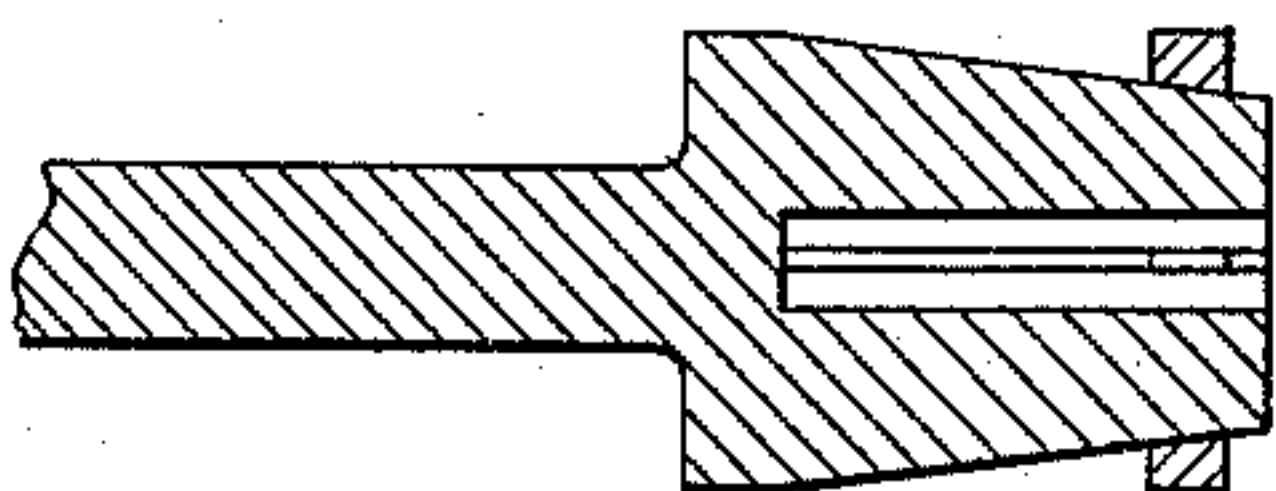


Fig. 24

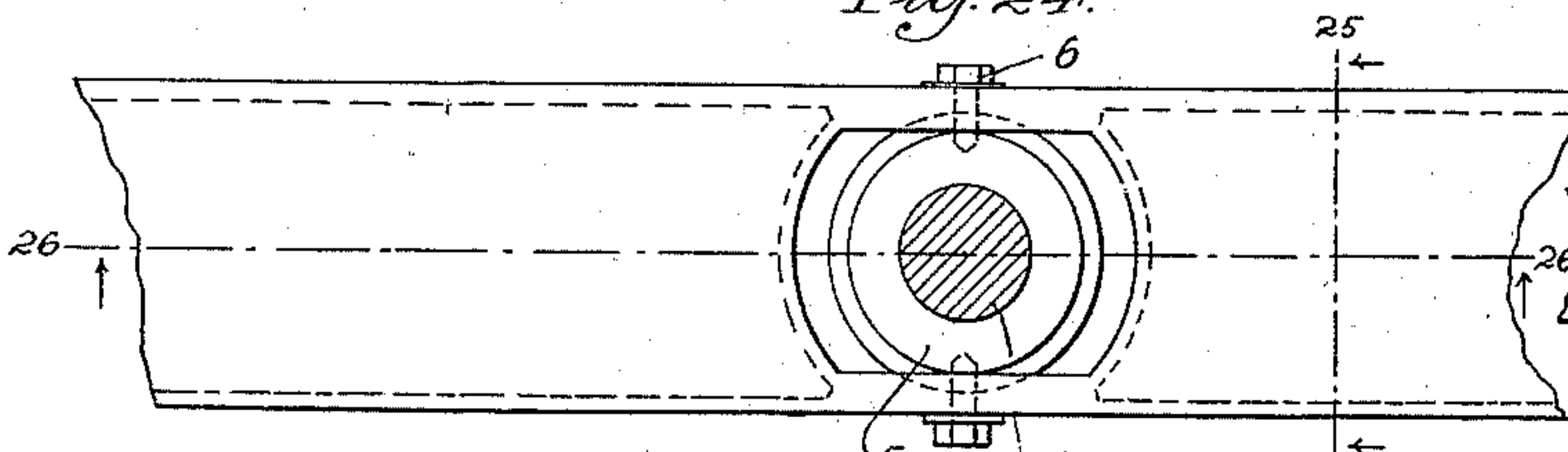


Fig. 25

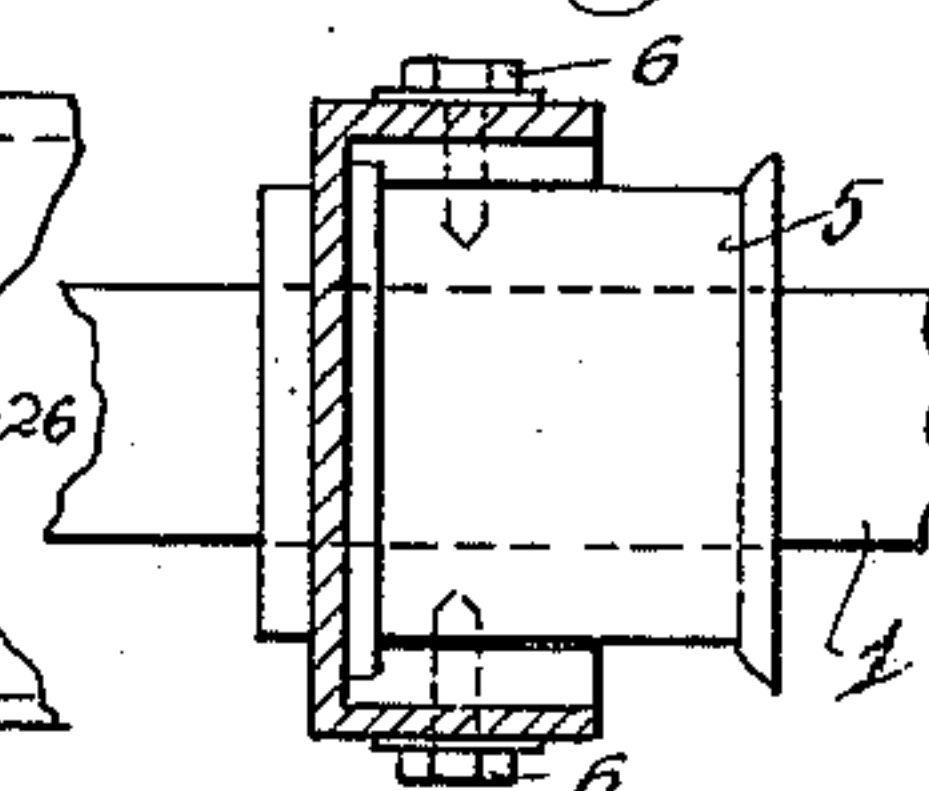
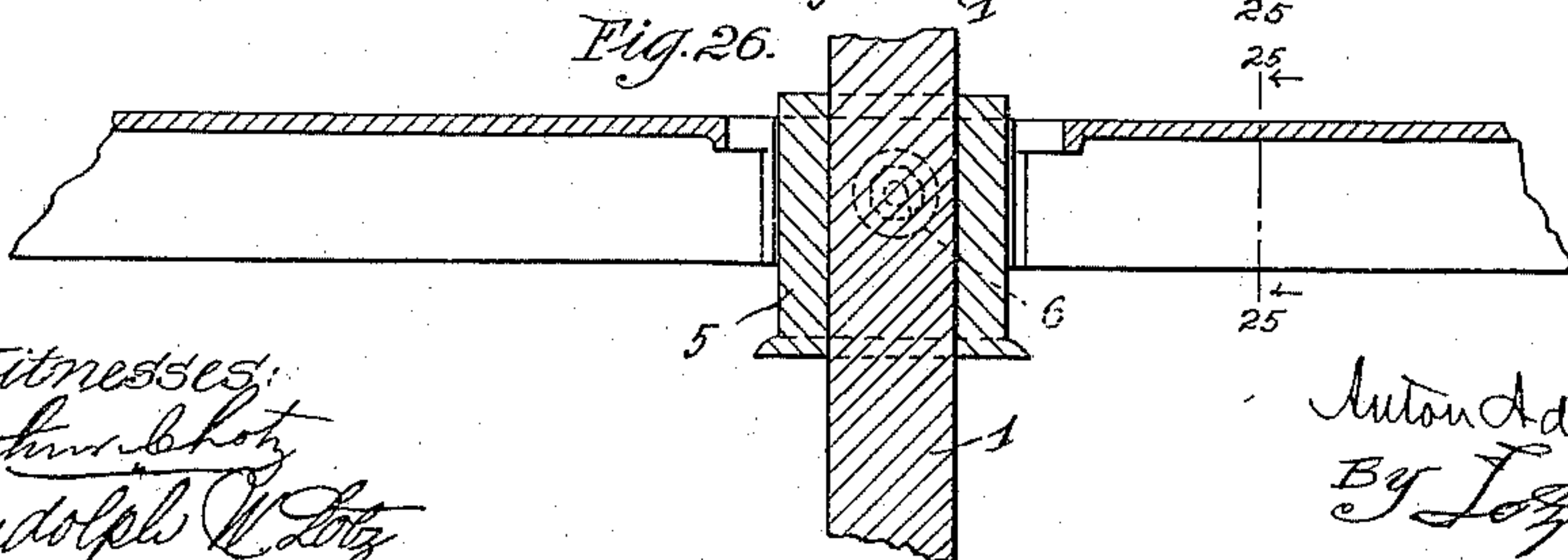


Fig. 26



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UNITED STATES PATENT OFFICE.

ANTON ADOLPH HAUSSKE, OF CHICAGO, ILLINOIS.

CARVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 561,510, dated June 2, 1896.

Application filed August 19, 1893. Serial No. 483,516. (No model.)

To all whom it may concern:

Be it known that I, ANTON ADOLPH HAUSSKE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carving-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a novel construction in a carving-machine, the object being to provide for the general efficiency and utility of a machine of this character.

The invention consists in the features of construction and combinations of parts hereinafter fully described and specifically claimed.

In the accompanying drawings, Figure 1 is a side elevation of a carving-machine constructed in accordance with my invention. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1. Fig. 3 is an end elevation of the machine, taken from the right-hand side of Fig. 1 and illustrating the arrangement of the parts when it is desired to enlarge the carving to be made. Fig. 4 is a horizontal section on the line 4 4 of Fig. 3, but extending only partially beyond the main shaft or upright of the machine. Fig. 5 is a side view of the upright used when the carving is to be enlarged or diminished from the pattern and taken on the line 5 5 of Fig. 6. Fig. 6 is a sectional view on the line 6 6 of Fig. 5. Fig. 7 is a sectional view of the main upright of the machine, taken on the line 7 7 of Fig. 8. Fig. 8 is a side elevation of the same. Fig. 9 is a sectional view on the line 9 9 of Fig. 7. Figs. 10 and 11 are top plans and side elevations, respectively, of one of the bars or links employed in enlarging and reducing mechanism. Fig. 12 is a side elevation of the end portion of the spindle-carrying arm. Fig. 13 is an end elevation of the same. Fig. 14 is an end elevation of the same with the spindle-carrying clutch removed. Fig. 15 is a vertical section taken on the line 15 15 of Fig. 14. Fig. 16 is a bottom plan view of the part shown in Fig. 12. Fig. 17 is a top plan view of the part shown in Fig. 12. Fig. 18 is a rear elevation of the plate or disk that is secured to the end of the spindle-carrying arm and

carries the tool-clutch. Fig. 19 is a sectional view of the same on line 19 19 of Fig. 18. Fig. 20 is an elevation of the spindle and clutch in detail. Fig. 21 is a side elevation of the clutch on an enlarged scale. Fig. 22 is a sectional view of the same. Fig. 23 is an end elevation. Fig. 24 is a horizontal section on the line 24 24 of Fig. 1. Fig. 25 is a section on the line 25 25 of Fig. 24. Fig. 26 is a longitudinal section on the line 26 26 of Fig. 24. Fig. 27 is a top plan view of the universal joint between the shear-arms and link.

Referring now to said drawings, 1 indicates the upright or standard upon which all the operative parts of the machine are supported, and consists of a shaft fastened in a vertical position by means of the socket-pieces 2 at the upper and lower ends thereof, which can be conveniently secured to the floor and ceiling of the room or other suitable parts. The machine is supported from said standard 1 by two supporting-arms 3 and 4 near the upper and lower ends thereof. These upper and lower supporting-arms extend on both sides of the standard and are provided between their ends with an opening that receives a sleeve 5, to which the said supporting-arms are pivoted by means of pivot-screws 6 on opposite sides thereof entering pivot-recesses in the said sleeve 5. The said sleeves 5 fit upon the standard and can turn with relation thereto while they are supported upon the standard by antifriction devices that serve to hold the sleeves against longitudinal movement, but which will permit their rotation. These antifriction devices are constructed as follows, and are shown in detail in Figs. 7, 8, and 9.

A plate 7 is provided with a slot 8, by means of which it can be secured to the upright by means of the screws 9. In this way the elevation of the plate 7 can be regulated so that the position of the upper and lower supporting-arms can be nicely adjusted. The said plate 7 is offset at its upper end, as shown at 10, and this offset portion carries an antifriction-roller 11. I have found it desirable to employ three of these antifriction-rollers equally disposed around the standard, as illustrated in Fig. 7. The sleeves 5 rest upon these antifriction-rollers, as illustrated.

To the outer end of the upper and lower sup-

porting-arms the tool-carrying frames are pivotally connected. The tool-carrying frames (indicated as a whole by 12) are provided with a plurality of arms 13 for carrying the tool-spindles, and with an arm 14 of the same shape, size, and location for carrying the feeler. Said frame 12 is provided at its upper and lower ends with the hollow shafts 15, by means of which said frames are pivotally connected with the supporting-arms 3 and 4. The said connection between the hollow shafts 15 and the supporting-arms embraces a sleeve 16, that is pivotally connected with the end portion of the supporting-arms by the pivot-screws 17, said sleeve being situated within openings 18 in the ends of the supporting-arms and the antifriction-rollers 19, carried by the plates 20, that are rigidly secured to the hollow shafts in the manner shown in Figs. 7, 8, and 9. The antifriction-rollers at the upper end of the machine are arranged to encounter the upper end of the sleeves 16, while at the lower end of the machine these antifriction-rollers encounter the lower ends of the sleeves, thus making in effect a rectangular jointed frame, all sides of which can move with relation to the others, but the upper and lower ends of which are pivoted to the standard of the machine.

The tool-carrying frames 12 are preferably cast in one piece with a main upright 21, the arms 13 and 14 extending therefrom and the shafts 15 leading from the upper and lower arms 13.

The tool-carrying spindles are situated at the outer ends of the arms 13 and are rotated by suitable mechanism which will be hereinafter fully described. On one side of the machine the tools cut down, while on the other side the work is secured above the tools, as will be obvious, for the jointed rectangular frame made up of the upper and lower supporting-arms and the tool-carrying frames will cause the arms 13 on one side of the machine to move in an opposite direction to those on the other side of the machine, and therefore the tables 22 on the side of the machine carrying the feeler are situated below the arms 13, and the tables 23 on the other side of the machine are situated above the arms 13. The said tables 22 and 23 are supported upon four posts 24 at each side of the machine, provided with adjustable feet, which are connected by the beams 25 extending between the same. The tables 22 and 23 are suitably fastened and braced to these parts.

It will be seen from the foregoing description that any up-and-down motion of the feeler-arm 14 will be transmitted to the other arms 13 of its tool-carrying frame 12, and that through the jointed frame such movement will be communicated to the tool-carrying arms 13 on the other side of the machine, but in a reverse direction.

I will now proceed to describe the mechanism for imparting the horizontal movement to the different tool-carrying arms. It will be

noted that the said tool-carrying frames 12 are pivoted vertically and will always stand in a vertical position. To turn them synchronously upon their vertical pivots, I employ two shear-arms 26, that are rigidly connected with each other and pivoted or swiveled upon the standard 1 in the following manner: The said shear-arms 26 are each provided between their ends with a sleeve 27, that will fit upon the standard 1, and between the said sleeves extends a collar 28, through which the said standard can pass. The collar 28 is rigidly connected at its ends with the sleeves 27 and serves to hold the parts rigidly together. The said shear-arms 26 are in vertical alinement and parallel with each other. To hold the said shear-arms upon the standard, I employ the antifriction-rollers 29 and plates 30, that are fastened to the standard 1 and constructed as illustrated in detail in Figs. 7, 8, and 9. The antifriction-rollers 29 encounter the upper end of the upper sleeve 27, while the other set of antifriction-rollers enters the lower end of the lower sleeve 27. In this way it will be seen that the said shear-arms 26 are pivotally supported upon the standard. The said shear-arms 26 are provided near their outer ends and at equal distances from the axes thereof with pivots 31, to which links 32 can be pivoted in a manner that the said links can swing vertically as well as horizontally upon the pivot 31. The link is connected at its outer end with the outer end of the tool-carrying arm 13 and has also a connection with the pivot 33 at the end of said arm 13, so that it can swing up and down and horizontally with relation thereto. This arrangement is the same on both sides of the machine and forms in effect what is known as a "lazy-tongs," and it will be noted that, therefore, whatever motion is given to any one of the arms 13 will be communicated and reproduced by the other arms, with the exception that the arms on the opposite sides of the machine will move reversely.

I will now proceed to describe the construction for rotating the tool-carrying spindles of the machine. Each of the tool-carrying frames 12 is provided with a shaft 34 concentric with its vertical pivot and, in the instance illustrated, extending through the bearings in the arm 13 and through the hollow shaft 15 at the other end of the frame 12. Above the upper end of the hollow shaft the shaft 34 is provided with a pulley 35, that is geared by means of a belt 36 with a pulley 37 upon the standard 1, which is driven by the pulley 38 upon said standard in a familiar manner. Each of the shafts 34 is provided with a plurality of pulleys 39, situated opposite the tool-carrying arms, and by means of which the said shaft 34 can be geared to the spindle that carries the tool.

It has been seen how the synchronous movement of the spindles is attained; but it is to be noted that the movement of the spindles on the opposite sides of the machine is reverse of each other. Therefore if the pat-

tern is symmetrical it will be exactly reproduced by all the spindles on both sides of the machine; but if the said pattern is one-sided, or, for instance, if the pattern is left-handed, the work made by the tools upon the same side of the machine with the pattern will also be left-handed, but the work made by the tools on the other side of the machine will be right-handed. This is an important feature and a marked improvement, for heretofore it was always necessary to have a right and left hand pattern, which not only entailed greater expense, but with which the same exactness and efficiency cannot be reached.

With my machine cutting right and left hand at the same time from one pattern it will be obvious that the different carvings made will be exactly similar, but reversed.

I have also provided means whereby the pattern may be enlarged or decreased, and will now proceed to describe the same. Of course in the parts above described, where the pivotal connections of the tool-carrying arms are similar to that of the feeler, the cutting-tools move the same distance and carvings of the same size will be made; but to accomplish the enlargement or diminution of the pattern I employ a feeler that is carried by an arm, and a link that is pivoted nearer to or farther away from the center than the pivots of the arms 13 and links 32, and have also constructed the parts so that the proportions of the same may be varied. To this end these upper and lower supporting-arms 3 and 4 are provided with the projections 40 and 41. The said projections 40 and 41 of the upper arm 3 are situated on its under face, while those of the lower arm 4 are on its upper face. Although in the drawings I have shown but two projections on either side of the pivotal connection between the frame 12 and said supporting-arms 3 and 4, it is obvious that the number can be increased according to the variety of adjustments desired. In Figs. 4, 5, and 6 I have shown the construction of these projections 40 and 41 in detail. The said projections are swiveled to the arms by means of a headed bolt 42, passing therethrough and upon which the projection turns. As shown in Fig. 3, an upright rod 43 is pivoted at its upper and lower ends to two of such projections that stand in vertical alinement by means of the pivot-screws 44 of familiar construction, so that the said bar 43 can turn on its longitudinal axis and upon the pivots between its ends and the arms 3 and 4. The said upper and lower shear-arms 26 are also provided, respectively, on their upper and lower sides with projections 45 and 46 and the same construction as the projections 40 and 41, and between two of these projections 45 or 46 an upright bar 47 extends and is pivoted at its ends thereto. It will of course be understood that the bars 43 and 47 can be connected with any of the said projections, according to the work to be done. An auxiliary link 48 and an auxiliary arm 49 are connected

with the bars 47 and 43 at one end and pivoted together at their other ends, at which latter point they carry a feeler. The said auxiliary arm 49 is rigid with the bar 43 and corresponds to the arm 14 on the other side of the machine, while the auxiliary link is pivoted to the bar 47, as shown in Figs. 10 and 11, the end of the link being bifurcated to embrace the rod and having pivots 47^a that enter pivot-recesses in the rod. This link corresponds to the links 32 of the machine. Over the said feeler carried by the arm 49 and link 48 a table 50^a is located, upon which the pattern is secured when the machine is being used in this manner.

It will be seen from the foregoing description that if the rods 43 and 47 are secured to the projections 40 and 45 the pattern will be enlarged; but, on the contrary, if these rods are secured to the projections 41 and 46 the pattern will be diminished.

It will be understood, of course, that the machine can at all times be provided with the reduction and enlargement devices; but, if desired, they can be removed entirely from the machine and only used when desired.

I have also made improvements in the head of the arm carrying the tool-holding spindle, which, as shown in detail in Figs. 12 to 20, will now be described. As the construction of the head of the arms 13, 14, and 49 are similar a description of one will suffice. This one arm is provided at its outer end with an upright plate 50, that is provided with a circular recess 51, which is beveled on its outer side to center a disk 52. This disk 52 is provided on its rear face with an annular projection that enters the beveled portion of the opening 51 of the plate, while the portion of the disk outside of said annular portion 53 lies flat against the front face of the plate. The said plate 50 is provided with two segmental slots 54, through which bolts or screws 55 can pass from the rear of the plate and into the disk 52, so that said disk can be held in any desired position within the scope of the said slots. The length of the slots 54 is such to permit a half-turn of the disk, and the parts are so arranged that when the spindle carried by the disk stands in an upright position the bolts 55 are situated about halfway between the ends of the slots, so that it will be manifest that the spindle can be thrown to a horizontal position in either direction.

On the front face of the disk 52 are two journal-bearings 56 to receive the shaft or spindle 57, that carries at its lower end the clutch 58. The said spindle 57 is provided with a pulley 59, that extends through an opening 60 in the disk 52. A suitable belt 61 is trained around this pulley 59 and the pulley 39 on the upright shafts 34, so that the said spindles can be rotated from said shaft 34. The clutch 58 on the lower end of the spindle 57 is of familiar construction and is shown in detail in Figs. 21, 22, and 23.

It will be seen from the foregoing descrip-

tion that the spindle can be secured upon the arm either in an upright position or a horizontal position at any inclination between these two limits, and therefore the tool can
5 work in a corresponding manner. Thus I am enabled to work upon not only flat patterns, but also upon curved or angular patterns—that is to say, to work sidewise.

It will be seen from the foregoing description
10 tion that for the machine constructed as above described any irregular-shaped article can be reproduced singly or in quantities and either larger or smaller than the original pattern, and, further, that I am enabled to make right
15 and left hand carvings of a one-sided pattern at the same operation and also either larger or smaller than the pattern. For instance, in reproducing a statue, if the face looked to the left by means of my machine I can make
20 it look either right or left and can reproduce both designs in one operation.

A marked advantage of my machine over those heretofore made, as far as I am informed, is that my machine is balanced and does not
25 require large counterweights to counterbalance the operative parts of the machine. In my machine the operative parts are distributed so that they balance each other, and therefore I am enabled not only to make a
30 more efficient machine, but at the same time to produce a machine whose capabilities will be greater in proportion to its cost, and, further, a large number of carvings can be made at one operation.

Another point of advantage is that the machine is simple and durable in its construction and can be easily adjusted and repaired. The parts are comparatively few and made in a simple and durable manner, so that they
40 will not easily wear out, as I have avoided complicated mechanisms and have employed only the simplest gearings and organization of the different parts to attain a machine highly efficient in its general action, and to
45 so construct and adapt the component parts both with reference to individual use and service relating to one another as to avoid the wear and breakage, thereby prolonging the life and utility of and rendering a cheaper
50 machine.

Another advantage of importance and which overcomes a serious objection in existing machines is the ability to work over larger surfaces than has yet heretofore been possible
55 consistent with a machine of desired dimensions. I attain this object by having the spindles situated one over the other, so that in a machine of ordinary dimensions I can work over a surface many times greater than is possible with a machine of ordinary dimensions where the spindles are situated next to each other, as will be obvious.

It will be understood, of course, that, except in the claims for the specific construction, I do not wish to be limited to the specific constructions and arrangements in the various parts herein shown, but contemplate and

intend to make all mechanical changes and substitutions commensurate with the scope of the following claims. 70

I claim as my invention—

1. The combination substantially as hereinbefore set forth in a carving-machine, of a series of arms situated one above another and opposite each other, devices to cause said
75 arms to move in unison, tool-carrying spindles mounted upon said arms, gearing to cause the rotation of said spindles, and tables located below said arms on one side of said machine and above said arms on the other side
80 thereof substantially as described.

2. The combination substantially as hereinbefore set forth in a carving-machine, of a main upright, upper and lower supporting-arms 3 and 4 pivoted to said upright, frames
85 12 pivoted to said arms, arms 13 and 14 carried by said frames, shear-arms 26 revolvably mounted upon said upright and connected with said arms 13 and 14 by links 32 whereby said arms are made to move in unison, spin-
90 dles carried by said arms 13 and 14, gearing to cause the rotation of said spindles, and tables situated adjacent said spindles for holding the work, substantially as described.

3. The combination substantially as hereinbefore set forth in a carving-machine, of a main upright, upper and lower supporting-arms 3 and 4 pivoted to said upright, frames
95 12 pivoted to said arms, arms 13 and 14 carried by said frames, spindles carried by said
100 arms, gearing to cause the rotation of said spindles, and devices mounted upon said upright and connected with said arms 13 and 14 and together therewith forming a lazy-tongs by means of which said arms are caused to
105 move in unison, substantially as described.

4. The combination substantially as hereinbefore set forth in a carving-machine, of a main upright, supporting-arms 3 and 4 pivoted thereto, two frames 12 pivoted to said
110 arms 3 and 4 on opposite sides of said upright, arms 13 and 14 carried by said frames 12, tool-carrying spindles revolvably mounted in said arms 13 and 14, gearing for rotating said spindles, and tables adjacent to said spin-
115 dles substantially as described.

5. The combination substantially as hereinbefore set forth in a carving-machine, of a main upright, supporting-arms pivoted to sleeves revolvably mounted upon said upright,
120 two frames 12 on opposite sides of said upright having revolvable sleeves pivoted to said supporting-arms, arms 13 and 14 upon said frames 12, devices to cause said arms to move in unison, spindles carried by said arms 13
125 and 14, gearing to cause the rotation of said spindles, and work-tables situated adjacent to said spindles, substantially as described.

6. The combination substantially as hereinbefore set forth in a carving-machine, of a main upright, supporting-arms having pivotal and revolvable connection with said upright, frames 12 having a pivotal and revolvable connection with said supporting-arms, arms 13
130

and 14 upon said frames, shear-arms 26 revolvably mounted upon said upright, and a connection between the said shear-arms 26 and a plurality of the arms 13, spindles carried by said arms 13 and 14, gearing for the rotation of said spindles, and work-tables situated adjacent to said spindles, substantially as described.

7. The combination substantially as hereinbefore set forth in a carving-machine, of a main upright, supporting-arms having pivotal and revoluble connection therewith, frames 12 having pivotal and revoluble connections with said supporting-arms, arms 13 and 14 upon said frames 12, shear-arms 26 revolvably mounted upon said upright, links pivoted to the ends of said shear-arms 26 and to a plurality of the arms 13, spindles carried by said arms 13 and 14, gearing to cause the rotation of said spindles, and work-tables situated adjacent to said spindles, substantially as described.

8. The combination substantially as hereinbefore set forth in a carving-machine, of a main upright, supporting-arms pivotally and revolubly mounted upon said upright, frames 12 having pivotal and revoluble connections with said supporting-arms, arms 13 and 14 upon said frames 12, shear-arms 26 revolubly mounted upon the upright, connections between the said shear-arms 26 and a plurality of the arms 13, downwardly-projecting spindles upon the arms of the frame 12 on one side of the machine, upwardly-projecting spindles upon the arms of the frame 12 upon the other side of the machine, gearing to cause the rotation of said spindles, and work-tables situated below the said downwardly-projecting spindles and above the said upwardly-projecting spindles, substantially as described.

9. The combination substantially as hereinbefore set forth in a carving-machine, of a main upright, the supporting-arms 3 and 4, the frames 12 carrying the arms 13 and 14, and the spindles, and having a horizontal revoluble and vertically pivotal connection with said supporting-arms 3 and 4, shafts carried by said frames concentric with its axis of rotation, gearing mounted upon said upright and connected with said shafts to cause their rotation, and gearing between the said shafts and the spindles carried by the arms 13, substantially as described.

10. The combination substantially as hereinbefore set forth in a carving-machine, of a main upright, supporting-arms having pivotal and revoluble connection therewith, frames 12 having pivotal and revoluble connection with said supporting-arms, arms 13 upon said frames 12, shear-arms 26 revolubly mounted upon said upright, connections between the said arms 13 and the shear-arms 26 at points upon said shear-arms equidistant from the center of the upright with the connection between the arms 13 and the supporting-arms, a bar 43 having pivotal and revoluble connection at its ends with the supporting-arms to

one side of the connection between said supporting-arms and the frames 12, a bar 47 having pivotal and revoluble connections with the shear-arms 26 to one side of the pivotal connections between said arms 26 and the arms 13, an auxiliary feeler-arm 49 mounted upon said bar 43, and an auxiliary link 48 pivoted at its ends to the bar 47 and the auxiliary feeler-arm 49, substantially as described.

11. In a carving-machine the combination with the main upright, of an arm 4 pivoted to a sleeve 5 revolubly mounted upon said upright, arms 26 secured to a sleeve 27 revolubly mounted upon said upright, a frame 12 carrying spindle-arms 13 and 14 pivoted to said arm 4, and a connecting-arm 32 pivoted to said spindle-arms 13 at their other ends and to said arms 26, substantially as described.

12. In a carving-machine the combination with the main upright of arms 4 and 26 revolubly mounted thereon and extending on opposite sides of said upright, and arms 13 and 32 pivoted to each other and to said arms 4 and 26 on opposite sides of said upright, substantially as described.

13. In a carving-machine the combination with the main upright, of arms 4 and 26 revolubly mounted thereon, said arm 4 being pivoted to a sleeve 5 and vertically movable thereon, and said arm 26 being rigidly secured to a sleeve 27, frames 12 provided with arms 13 carried by said arm 4 and having their bearings in sleeves pivoted to said arm, and arms 32 pivoted to sleeves carried by said arms 13 and at their other ends to sleeves, carried by said arms 26 so as to permit the said arms 32 to swing both vertically and horizontally, substantially as described.

14. In a carving-machine the combination with a main upright, of upper and lower supporting-arms pivotally and revolubly mounted thereon and carrying frames on opposite sides of said uprights, spindle-carrying arms on said frames, means for rotating said spindles, and means for causing said spindles on opposite sides of said upright to move in unison in reverse directions, substantially as described.

15. In a carving-machine the combination with a main upright, of upper and lower supporting-arms pivotally and revolubly mounted thereon and carrying frames on opposite sides of said uprights, spindle-carrying arms on said frames, means for rotating said spindles, and means for causing said spindles on opposite sides of said upright to move in unison in reverse directions, consisting of shear-arms revolubly mounted upon said uprights and provided with links pivotally and revolubly secured thereto and pivotally and revolubly connected at their other ends with the ends of said spindle-carrying arms, substantially as described.

16. In a carving-machine, a main upright, arms pivotally and revolubly mounted thereon and carrying spindle-carrying arms on opposite sides of said upright, and shear-arms

revolubly mounted upon said uprights and connected at their ends with said spindle-carrying arms by means of connecting-links having pivotal and revoluble connection with said 5 shear-arms and said spindle-carrying arms, substantially as described.

17. In a carving-machine, a main upright, upper and lower supporting-arms pivotally and revolubly mounted thereon, frames 12 10 carried by said supporting-arms, arms 13 and 14 carried by said frame and carrying spindles at their ends, and gearing to cause the rotation of said spindles consisting of a main

pulley on said upright geared to shafts carried by said supporting-arms and provided 15 with pulleys geared to said spindles, said gearing being so arranged that their drive-belts are always taut regardless of the varying positions of said shafts and spindles, substantially as described. 20

In testimony whereof I affix my signature in presence of two witnesses.

ANTON ADOLPH HAUSSKE.

Witnesses:

HARRY COBB KENNEDY,
RUDOLPH W. LOTZ.